The Practitioner's Toolbox

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Plastic form creation is unique to human endeavor and is above anything else an activity. That it is so universal both across time and population demands that it be categorized as a basic behavior of our particular brand of animal species. Whether it was coeval with our particular brand and its manifestations lost by the veil of time, or whether the behavior was latent or adaptive has little bearing on the fact that it is ubiquitous both from the standpoint of production and legibility: We all can 'read it'. If one approaches 'art' with this understanding as the general context, then the content spilling forth from galleries and museums (to name merely the obvious repositories) becomes much more obvious for what, I believe, it truly is. These 'images' attracting the visual and touch sensations are but one means among others we use to extend our perception of the environment much like binoculars serve a birder or loud speakers a packed stadium. They are much needed enabling devices for focusing our attention above the din of benign noise and distractions and therefore, also serve as mnemonic devices. The purpose of this impulse for 'amplification' is to manage and predict successful outcomes, in other words to abet survival.

An inward 'image' is not 'art'. Capacity for something is meaningless without action. Invention is the key and the cognitive crossroad between ancestor species and our own. For example, we are born pointers – an intra communal signal. I doubt an early Christian hermit living isolated in the Sahara would sense the need though he may have the capacity. And perhaps, wild apes may well have this capacity too but don't execute it. Some feel they are capable but lack incentive, (Pika and Mitani 2009:166-180) due to their behavior of anti-social dynamics. They can perform a 'directed scratch', a grooming preference much like your cat or dog's effort to get a good tummy rub when they roll on their backs but that seems to be all. Translating an inward thought by means of an outward gesture for the common weal is just not the 'ape' mojo. But it is ours.

Crossing that bridge from idea to the activity knowing that the action has a commonality of significance which must be translated back as an idea in another person's mind is no small feat. Those familiar with basic 'cognition' terminology will immediately know that this supposition of commonality is called a 'theory of mind'. But that is already getting a bit lost in the weeds. To get past the inherent complexity of this kind of cognitive formulation through to physical performance is really a question of incentive. It is therefore, the degree and nature of intent that is at least for this discussion, of great significance. This is why for all animals having some

semblance of search criteria for food, mating and shelter preferences, they are not 'artists' only we are. Decisiveness is key, an attribute that Harvey Cox considered the most distinguishing characteristic of humans:

> "Although he seldom thinks about it, man knows himself as that animal who must make decisions. (Cox 1967:viii)

This article states the obvious that ironically rarely gets stated: That image creation is a physical endeavor not to be taken lightly and should factor as the first line of inquiry into evidence for our advanced cognition rather than cycling through the relatively useless stacks of art critical exegesis and semiotics. That it hasn't been treated to the same scrutiny as it should logically be, is due to the historicity for better or worse of its own penumbral image – we have fallen in love with the long shadow these objects cast. We are overwhelmed by the result and get lost in its ramifications rather than its behavioral origin and impulse.

Physically transferring 'It' is art though the terms of identification are rigorously debated. In some respects connoisseurs and bards may be correct about inspiration being the impetus though not for the reasons normally considered. What they are trying to explain is that something extraordinary must trigger the cross over from inward imaging to outward formulation. Scientists call an aspect of this process 'capture', something we instinctively teach our toddlers over delightful books like, "Pat the Bunny" (Kunhardt 1940: Fig. 1). It generally refers to the fusion of data between senses, most often discussed in terms of auditory sound correlating with vision. When we speak of eco-location we are addressing 'capture', finding the form to match with the sound.

But this applies to touch and limb extension as well. For example, we come to understand by trial and error the length of our own arm and calculate how far to extend it to grasp an object. We acclimate our young to this knowledge through equations for seeing and touching as well as to audio and olfactory prompts. Every culture has its own battery of such nurturing games that encourage planning and extending their limbs towards targets and for foveating or focusing vision, a volitional determination about where to move the eyes and how far to move them in order to regain their precise place, in this case, on the bunny page. We are hardly alone is this kind of tutelage.

This cross modality mash up is best described in the extreme by what happens when a blind person suddenly gains sight and has not fused these sensations:

> "…They fail to identify seen objects with their felt versions…However they succeed on doing so after a few days of sight….this rapid learning resembles that of adaptation to rearrangement in which the experimentally produced separations of seen and felt perceptions of objects are rapidly reunited by the process called capture…" (Ostrovsky, Sinha 2006)

So art critics, connoisseurs and 'appreciators' are generally correct. 'Art' can be excruciatingly difficult, even nerve or neuron racking, which it quite literally is as I hope to explain at least in part as we go. At its best, it is a dialogue of haptic (touch) industry and kinesthetic (movement) awareness that is held in check by constantly referencing against a changing mental image. Every choice, every move we make alters the mental picture as we go, fed and stimulated by the continuous prompting of sensual input from touch and movement. And even for the wordsmith, whom we typically think is left brain driven by symbolism and less affected by tactile suggestion we find this not to be the case at all. That same haptic/mental dialogue prevails with tomes of examples referring to the pleasure of the scribing process itself.

I would suggest that it is identical to the imaging crafting one as well where it would appear that this so called 'fertile exchange' is more truly a rotation of attention: The physical execution allows time for the mental one to reboot. The clumsiness of our movements, the drag of the pencil the tapping of the keyboard allows us the time to reconfigure the imagery. And that is a very good thing. A recent description by the writer Philip Pullman stands out as he decries the use of the internet:

> Moving a little mouse about and seeing a cursor zip down a screen – it is not satisfying. I would infinitely rather draw something – there is more pleasure in moving a pencil across a slightly resistant but also slightly forgiving surface of a roughened paper…I like a sensuous engagement with things.Yes!! (Mitchison 2010)

This article tries to demystify that magnificent and decisive process, both from a visualization standpoint and a physiological one, the latter being the course most often overlooked but ultimately the most defining because it is the only way of getting it 'done'. The primary tools will be that discriminating for 'difference' is the starting point and how that gradually moves outward through the physical act of separating, collecting, isolating and confining or literally pinning the image down. Ultimately all art form results from the mental and physical process of isolation and confinement so that attention can not waiver beyond the presentation of the form. There is a method to this madness. But first, why is fixing attention by confining imagery so important?

Because ‘art’ is a mnemonic device and as any such memory enhancement tool it functions in a forward seeking role by prejudicing recognition. Once you see Monet’s Water Lilies (Les Nymphéas), you cannot regard any aspect of a real time water lily without filtering through or past his seeking device. And this too is a purposefully driven impulse, not for pleasure, not for beauty, but for success. ‘Art’ therefore, is a vestigial behavior to construct search alarms both good and bad that accelerate the possibilities for survival. It’s our version of looking for the worm and looking out for the hawk.

When the object bearing image is extricated from its circumstantial context then a closer relationship is triggered because of its immediacy with the viewer. A Faberge Egg tossed into a mass of gleaming jewelry releases its content but held in hand amplifies it. We see this best with relatively modern distribution channels that we take for granted like graphics, books and the internet. But we can just as easily understand the remarkable proliferation of ideas and cognitive sophistication in Aurignacian art when it was isolated and pinned down to their stationary objects like horns, animal bones, pebbles, shells and rock faces including subterranean ones, though in a different way and much like a movie theatre. By both capturing and captivating our attention in these oft used smaller objects the ‘appreciator’ had ample opportunity to revisit the image on a highly restrictive format without re-focusing their attention elsewhere. Imagine holding a Faberge Egg. Imagine a Japanese holding a Netsuke carving, imagine a small child holding a Thomas the Tank Engine and then imagine primitive man holding a torn leaf poked through with three dots against the rays of the sun.

Intimacy has always been key, a dialogue of sorts where the viewer grappled with the imposition of an image against his normal pre-occupation with the boundaries that defined himself such that sensitivity to sensory input was turned down in order to turn up the image. If we take a moment to analyze what we do when we view art, we’ll easily recognize this exchange, where the body or self is left in abeyance over the consideration of an image, and back and forth it goes. But this is nothing remarkable since any act of ‘attending’ shunts cognitive focus. If my foot hurts and I’m thirsty, I’ll forget the discomfort when I finally drink. If I’m depressed counting distracts me. If I’m in love I can forget I am thirsty.

Hand held images reproduced in books beginning with woodblock, line engravings, then lithography (Invented by Alois Senefelder accidentally in 1796) and later photographic reproductions disseminated in magazines and the like often have far more impact than the real deal because the eye and focal point is contained by the rigorous format of the page before you as

compared to the distractions of a museum and the ambient noise of competing art, surroundings etc. Removed from its self selecting context, imagery in a vernacular setting has to battle through so much more. The same intimacy is true to an even more heightened degree by the hosting of the internet's bright screen that draws attention exclusively to the frontal plain without peripheral distractions so that when art is represented, we are able to scan it more thoroughly within a circumscribed locus and without any visual conflict. As a result we naturally tend to iconize images more readily in this manner of presentation because of the immediacy of the viewing and the natural intimacy.

For example, I will never forget my shock on finally seeing a 3 dimensional copy of the Venus of Willendorf (fig. 2) at the Museum of Natural History having long viewed the icon in books and photographs. I believed it to have been larger than life which is always the natural tendency when recognition of imagery is constructed out of context and therefore exemplary. This is important. Art is intentionally exemplary. It's behavioral directive is not of indulgence as many would guess but rather as purposeful. I still like to inform people that the Venus is a mere four and a half inches tall which never fails to illicit utter shock.

The point being, that isolating objects is the most effective means of presenting 'visualizations' something I suggest that anatomically modern man naturally came to discover when they adapted objects such as pebbles, animal bones and horns, rock faces and utilitarian objects thereby captivating their audience with a frozen format. Movies are a case in point though not obviously so since we think of the moving image rather than the fixed presentation or delivery system. Darken the chamber to cut down on peripheral distractions, brighten the screen and bring it front and center - and the presentation speaks for itself. As Frank Capra, the famed MGM director explained:

> No saint, no pope, no general, no sultan has ever had the power that a filmmaker has, the power to talk to hundreds of millions of people for two hours in the dark. You have the power to say anything you want, so why not say something positive? (McBride 2000:191)

But this is extreme to say the least. Other platforms served just as well particularly when we considered them as objects rather than purely images. But before we can discuss this on any deeper level, we first have to consider the very first step in this process.

What's most curious though not surprising about human perception, is that like most animals, we sense differences more readily than consistencies, a point rather obvious when considered in terms of survival imperatives to quickly identify aberrations in time to make life saving adjustments. When isolated in experiments, such behavior speaks loud and clear:

> "…there appears to be an interesting paradox in the human ability to categorize a complex scene presented for a brief time such as 100 milliseconds…Although they may fail to detect small inconsistencies in the picture, they will notice any large systematic inconsistency. ..(the same person) may be completely incapable of reporting what appears in the place of the error when the picture is errorless and complete." (Sutherland 1968:301)

But this fact also acts in reverse, that redundancies connote safety and an unnecessary investment in attention. Deciding what constitutes a safe paradigm from a remarkable one is common to all creatures in their survival behaviors. For humans, we instinctively recognize that repetition is code for safety and interference or obstruction of it is not. Extreme coping devices for anxiety as in Obsessive Compulsive Disorder hinge on methodical repetition. We count when we exercise to get through it. Routine is comfort food. But 'art' does the same by inventing patterns that repeat and are in effect mollifying code for, "You don't need to attend to this." The hitch is that we have to scan along these rhythmic images with our cognitive antennae fully up to determine if there is an aberration before letting it go. And we do so all day long, scanning for interference and for repetition faster than most of us are even aware.

Another primary tool in the practitioner's start up kit is the awakening of autobiographical subjectivity and the incumbent confusion that one's body is not all space but merely a volume moving through it. With this comes the legitimate concern that other animals perceive better or at least differently and that we are, therefore, handicapped. This reinforces the need and means of discerning boundaries including our own. Figuring out where our physical body begins and ends; where to draw the line of separation when touching something; how far our voice carries, and where the boundaries are for our riveting thoughts that seem to fill space - all hark back to the dynamic aspect of 'difference', the boundaries between things that also define things. I don't mean to be murky here, but when you can encapsulate or discriminate the extent of a given mass, that a shell in your hand has a distinct edge against your skin then you understand that it is

different than your hand. Bear in mind that 'difference' is also the flip side of 'sameness' - what I call the ying yang-iness of all image crafting. Recognition of one automatically confers the opposite. If I notice an odd leaf, I am also noticing that the others are rather dull and the same. Advertising thrives on this imbedded polarity to drive home the uniqueness of a product. But the juxtaposition of extremes as evidenced by Figures 3 and 4 is significant for all imaging. Sometimes it is more subtle but always it is a key operative in searing a cautionary narrative into one's mind. We remember something best by knowing what it is absolutely not.

Another tool is the concept of 'riddling', whereby 'Art' is the formula or set of answers that coalesce around an implicit question, "What makes this thing different?" This can also be asked directly as, "Have you noticed that…?" The attributes of any invented image are in fact a culture or individual's answer to this implied riddle. And finally, all of the above derive their value from the empowering belief that "Knowing is enough to see." If I had to choose one cognitive concept that drives human image crafting it is this.

Given the enormous variety and extent of human visual impairment from mild myopia to near total blindness as well as cognitive occlusions like prosopagnosia (difficulty recognizing faces) or Capgras Syndrome (doubting the person you recognize is that person), 'visualizing' depends on judgments that become shorthand guides for assessing whatever amount of optical data can be individually processed. For instance, my college age daughter is not particularly neat. Her 'idea' of an orderly room overlooks what's on the floor. She can't 'see' what's there because of a belief she holds about neatness, it's not a question of unwillingness to 'look' it's a judgment as to what constitutes order. Plugging into her riddle for what a neat room is, it goes something like this: "What has a neat bed, a folded blanket, and no shoes visible to the naked eye?" The answer is her room, even if the shoes are strewn under the bed or in the corners, the garbage is full, her dresses are on the couch, etc, etc. These were not part of her riddle.

The mere fact that our historical record and our lives are littered with these visual 'riddles' implies that it is not merely an impulse that will not die, but a behavior that is still vital. This is despite finding an esoteric nest amidst empty white gallery walls in its most self conscious and isolating extreme and in the vernacular mix of every day packaging, clothing and popular culture. Therefore, it speaks to the fact that it is still a dynamic search for the best and most memorable way to define the differences in this world's content as cautionary devices that flag importance and that no two individuals figure out the same search criteria and no single artist does either. In

fact, this is likely the motivation behind an artist's oeuvre, a 'riddling' out process that changes over time despite zeroing in on subject matter that can often be extremely limited such as still life, street scenes, portraits or squares. Each of us who 'creates' does so thinking that the present attempt can riddle it out better than previous attempts and that it is benefit for others, be it the 300th try at a three minute love song or a painting of a shoe. Here's a warning song about love by Sammy Cahn and Jule Styne:

> Friends ask me out/I tell them I'm busy/I must get a new alibi/I stay at home and ask myself where is he/Guess I'll hang my tears out to dry/Dry little teardrops/Hanging on a string of dreams/Fly little memories/My little memories/Remind him of our crazy schemes. (Cahn, Styne 1945)

As for the rest of the world, namely those who 'appreciate', they are seekers as well who look for 'riddles' that best filter for their views. They discard them as they personally move from setting to setting and age to age. Obviously, I appreciate Sammy Cahn's riddle about lost love.

Taken a step further, making up riddles about what you see is inventing formulae about how you are seeing it. In other words, this tool is purely cognitive and it necessarily comes bundled with the others already mentioned but it predisposes for attending to stimuli with some kind of prejudice. All animals do this to one degree or another because they have to. No vision is 'all vision' and every sensation merely partial. But at the point when we trusted that 'knowing was enough to see', we were able to compete more effectively with our respected adversaries whose vision was clearly more keen or more certainly different than ours. 'Art' became the means by which to extend our visual limitations and it still is to this day by explaining which attributes mixed together are most noteworthy. 'Imagination' is a sloppy term for the variety of riddles we invent to sharpen thinking around the idiosyncratic vagaries of those sensory inputs. No two people process alike, and no one person processes the same way from moment to moment.

For these reasons, we need to take a brief look inside the brain to find out how electro chemical activity is suppressed for the greater good, and how it is excites, stabilizes and synchronizes our gross motor movements without which we could never execute in space and time what begins as a one dimensional spike of almost instantaneous moment. Logically there is no means to freeze it and therefore, transduce it. One cognitive phenomenon does not naturally slip into the other's physical dimensions, it must be captured and transmogrified. Quite literally, the clarity of the original mental spike must necessarily degenerate through the clumsiness of executing it in physical time.

At best it triggers a dialogue of the somatic sensory system – the sensory routing of mechanical forces with regard to our body surface, muscles and joints referenced against and coordinated with an ever changing mental visualization. This is inevitable due to the fluid processing of our central nervous system for input from our touch receptors in our skin, most notably our fingers (haptic or tactile); our muscle and joint 'spindles' sensing pressure and flexing (propioception or kinesthesis) and our balancing feedback apparati with regard to self motion, stabilizing gaze and spatial orientation (vestibular sensation).

Every choice we make alters the mental picture as we go. For instance, when we draw from life, we must focus away from our medium and find an optical reference point out there, make a plan or mentally practice a movement for the intended shape or line as to where to begin it, turn it and end it. Then we memorize it long enough (seconds only) to sustain returning our gaze to the pad and then finding the spot we momentarily left when we looked away. In other words, we are constantly shuttling our attention between inward image and outward activity which conflict and mutually distract from each other. Even if we draw from our imagination the conflict and shuttling is the same. The physical activity derails the mental one. We make do, because we rarely come back to the exact focal point we left without some small degree of searching for it both 'out there' and back on the page. At which point our short term memory has lost its firm grasp of the 'plan'.

This happens in part because of the physical encumbrance of relocating our eyes and re-placing our hand. We are forced to check back, make do and check back again, each time finding the mental image or intention severely compromised by the reality of what our peripheral nervous system and the direct synapsing of muscle fiber to induce movement was able to actually accomplish. So even if we never remove our eyes from the object underway, thinking versus activity shuttle back and forth, never completely overlapping. We 'attend' alternatively. Clearly, we make endless concessions as we go because the physical execution is so clumsy and outstripped by the adroitness of the mental one. When we finally 'capture' it, it is nothing like the original intention or even the most recent one which does not mean it is more or less successful. In fact, it is probably more successful because we innately recognize our physical shortcomings with regard to transduction and thus begin the triaging process. We shall address this in further chapters, but it is significant for the efficacy of disseminating the image in the community the success of which depends on what must be accentuated. That 'art' is a locally driven cognitive

process embedded exclusively in the matrix of our visual system, belies the reality of how it is done and undercuts the remarkable level of cognition to execute this feat.

Imposing standards of depiction or symbolism beg the question and are not germane to this discussion right now. If you recognize that a dog upon hearing its master's footsteps runs to meet him with the right clothing in its mouth, then you are quite hard pressed to say that the dog does not appreciate symbolism but we do. It has selected the appropriate equation for its master even though it has not created a new form. Obviously, 'visualization' in symbolic terms is a slippery slope. So we'll keep it simple.

The 'Appreciator'

There will always be the 'appreciator' who infers meaning versus the practitioner who activates it. How to draw the line on where functioning and selectivity becomes symbolic invention is not for me to say. If one tries to base it upon the ability to make an exchange of an inward or outward behavior such as an emotion or activity for an image then we are addressing what many consider to be the highly sophisticated swapping out of metaphor which in its linguistic convolutions and puns becomes something called metonymy and synecdoche. But the tools used for all these kinds of exchanges first begin with the ability to evaluate and fix the assets by some means that allows for restricted modifications. Assets can be stretched, reduced and amplified up to a point. What does this mean? It means that buried deep within the stories we concoct about objects there are inherent limits. Stories are made up of subsets of attributes. And like most constructions, syntax matters.

Confusing similar shapes like a diamond for a triangle is quite consistent with a rigorous system of evaluating. One would assume those animals with similar eye structure make similar mistakes. But pattern processing as it is often called, cuts across enormous divergences like the rat and the octopus. In 1963 N.S. Sutherland and Carr discovered that many like the octopus can make adjustments for sizes by a factor of 16. And many species accomplish what we try and teach our children with toys and blocks and drawing, to transfer that discrimination from hue to value (color to light), from filled in to outline, and from fluid to jitter or distortion. We and they allocate as much for what it is not as for what it is.

Appreciating qualities in a shiny pebble and curating them as did our hominid forbears in 'manuport' collections as widespread as South Africa, India, France and Israel cannot speak directly to categories of 'meaning' beyond the obvious that it mattered to them. Gut responses to sensory inputs can be as visceral as the response to one's eventual mate or steering clear of the Durian fruit for its rank odor. This is a form of capture and clearly the simplest basis for all symbolism. I trace or link the odor to the fruit. Therein, I equate the fruit with the odor. Two symbols for the price of one. I avoid the fruit as a result – negative collecting.

On the other hand, a Capuchin monkey mother of South America teaches its observant child how to select the right stone often as heavy as its own body weight to crack open the dried nuts of the palm fruit and extract the seed (Westergard 1995). Eventually they learn what stones to select from the river bed over a mile away so that finding them can prompt a secretion of digestive enzymes in their saliva in anticipation of eating, a visceral response as well and one we all know when our mouth waters over delicious images and smells. 'Meaning' is not bi polar - either turned on or off but rather layered so that true affection builds for these objects and coveting them can become an act of connoisseurship in and of itself. All we can infer from the Paleolithic pebble and crystal troves is the process of collecting but it represents a crucial first step towards transferring the inward image to an outward one.

This may in part or wholly explain the impulse for such activity confirmed by deposits of transported crystals (Singi Talav, Rajasthan, India and Gudenus Cave, Austria), haemetite pebbles (powder found at Czech site of Bečov), red ochre (Wonderwork Cave, South Africa and Ambrona, Spain) (Bednarik: 2003) and rocks found to date back to the Acheulian Era and in some cases like South Africa to possibly 800,000 years. "These hominids distinguished between ordinary and unusual or exotic object types: they had begun to classify the object world…" (Bednarik: 1995:611) I would amend this to: They had begun separating the world.

On the other hand, what is often considered to be primitive thinking (and I would include my domestic pet here though that might not be entirely fair) is the sense that attributes are not fixed but capricious, including the sense of your own extended self. This works just as robustly in reverse, that other entities including natural forms have extended borders if they have borders at all and can affect anything with which they come in contact. This is less about fixed assets and

more about fixed borders. For these reasons such 'logic' supports the notion that qualities are mutable and can be easily borrowed, and inversely that an individual can slough off their own attributes if they lose an element of clothing, a piece of hair, or their footprint is appropriated, transversed or defiled. This sticky kind of associating is most fluid when there is an outward similarity and matching up of apparent characteristics.

Perhaps this is best described by the first handprints your toddler brings home from school. This is at once a proud and defining moment where the child begins to understand the concept of physical 'self' and identity through visual markers but it is also a fearful one where those prints are now separate, expendable and mutable. We don't know all the motivations behind the ubiquitous handprints of the Paleolithic and Neolithic prints that occur in: Ancient American Pueblo hand prints of the "Place of Many Hands" in Southeastern Utah from the Basketmaker Period; the hand prints of the Australian Rock Shelters of Wuttagoona in New South Wales; the hand silhouettes of the Gravettian Period in the Paleolithic Cave of the Grotte de Gargas (Figure 5.) in the Haute Garonne, or the Neolithic Cueva de las Manos in Santa Cruz, Argentina.

But when compared to a random shuffle through contemporary gallery fare the stubborn trend for collectibles yields work like Peter Marigold's 'Split Box Series' (Libby Sellars Gallery) or Albert Allen's, 'Fourth Dimension' (Figure 6.) at the Sherry Hill Fine Arts Gallery (Sherry Hill is Allen's wife), that of an easel size frame containing hundreds of cast hands: "One of the most surrealist artists of our time" (Reigosa 2010). How this might differ in content and meaning with the ancient hand imprints I leave up to the reader. I suspect that despite verbal sophistication the basic motivation is unchanged. In a like manner, I do not know whether the canine with a shoe in its mouth believes that his owner is transferred to this property allowing him some semblance of control for bringing his master in and out of the house. But clearly there is some rigorous discriminating underway based upon matching. In which case, the dog displays far more metaphoric sophistication than we care to admit.

For these reasons I do suspect that for some of the primitive manuport pebble collections, that this is not at all farfetched. A case in point was the collecting of eagle stones (aetites) to wear as a protective amulet around the neck of expectant mothers, a common practice in the Ancient Near East and well into Europe of the 17th century. I mention it because of its homeopathic simplicity and attribute matching. This ferruginous geode stone is found in streams and has a natural rattle when shaken due to the fact that there is another smaller stone within. That this could have impact

on the outcome of a pregnancy by virtue of contact, speaks more about an extended and fragile boundary of one's own identity than it does about symbolism.

Magic belongs to this fractured sense of a stable and crisply defined 'self'. It represents a long bridging evolution from the circumstantial and semantic sense of identity or point of view to a highly subjective and encapsulated one. Even today, none of us is completely free of this tendency. Our culture belies this undercurrent from which we have never fully emerged. Therefore, when we look at 'art' we might want to keep this in mind, that not only are these individualized depictions of the world they are what's left from an effort to seek out the boundaries of merging entities.

This is why I have chosen a uniquely seismic moment in our 'image crafting' evolution to underscore 'collecting for difference'. These would be the Laetoli footprints of South Africa (Figure 7.) if in fact one set is truly the palimpsest of the other and only if. "The Laetoli footprint trails consist of two sequential sets of tracks of three individuals of differing foot sizes…on the right there are two overprinted trails."(Day 1985:117) (Tuttle 1985: 129-133) In the mid 1970's, Mary Leakey and Andrew Hill discovered two distinct sets in the substrate of hardened volcanic ash in the Laetoli formation of Northern Tanzania. They date to around 3.5 million years ago in an era called the Mid-Pliocene. Argumentation over their hominid identity, whether they were Australopithecus Afarensis, Robustus, Africanus or other is hardly the most intriguing point. What is, however, is that the shorter trail of 31 prints was overprinted by a slightly larger foot that literally followed in its predecessors footsteps. How long after the first set was laid down, no one can say.

I choose this type of event as the startling pivot point of advanced cognition as evidenced by a new kind of 'visualization'. Most often, much more recent ones in the Aurignacian period of 60 to 35,000 years ago is selected, the later date witnessing the outcropping of a jolting degree of iconographic sophistication in parietal (wall) and mobiliary (transported) art best known in the Grotte Chauvet in the Ardeche, France (Chauvet Pont D'Arc Cave), Altamira in Northern Spain and Lascaux, in the Dordogne. This is the transition referred to as "The Sapient Paradox" coined by the material archaeologist, Colin Renfrew in 1996 (Renfrew 1996).

> …the biological basis of our species has been established for at least that time (and perhaps for as much as 200 000 years),While the novel behavioral aspects of our 'sapient'

> status have taken so long to emerge or to construct themselves, or rather that they have done so very recently. (Renfrew: 2008B)

It wonders out loud over the frustration that evaluating modern human cognition can only be made from the evidence and that the evidence can only be stable taphonomy despite a 100,000 year lag between the first presence of our species and these representational fabrications.

This is a very slippery slope upon which to build theories of 'visualization' because it cannot assess the evolution of 'transduction' if the precedents like rope and fibers, straw, lines in the dirt, unfired clay and assemblages naturally decompose. The earliest date so far for a woven or twisted flax fiber has been found in microscopic soil samples around a cave site in the Republic of Georgia by Ofer Bar Josef and his team. This too dates back to around the bell weather 35,000 year mark. But it tells us absolutely nothing about image creation.

Acting out Difference

Walking in another's footprints is significant for those tracking the evolution of human cognition and for those tracking the twists and turns of visualization for a variety of reasons. Collecting like forms as already mentioned is symbolic behavior despite what many like Randall White believes is much less so especially regarding Neanderthal scavenging of Cro-Magnon industry in the Châtelperronian phase of the Paleolithic, "…metaphor was not part of their neurological and behavioral repertoire." (White1992:558) This represents the overlap period of two co-existing species and a cross fertilization of behavior represented in the tools found at the French site La Grotte des Fées in Arrier.

Yet collecting, coveting or connoisseurship is the greatest form of flattery that always leads to some form of idolatry and mimicry. And collecting, be it gathering ripe fruit or expensive baubles devolves around implications: These are the mini stories that cognition attaches to objects. Collecting ripe fruit implies nutrition, survival, relaxation. This is a story constructed around an image. Large diamonds are collected for stories about status and power. Neanderthals collecting the better crafted tool work of the Cro-Magnon by virtue of their connoisseurship alone insists that symbolic swapping out of a story for an object is in full swing.

Yet there are some exemplary creative periods in our history that are naturally borne of this mutual influencing and intellectual cross fertilization. White's point really is that there was little creative pollination, neither for the Cro Magnon take away from Neanderthal influence nor vice versa. In such periods we look for inventions and in this case they flagged.

Truly remarkable examples of this kind of creative leaping most often occur as a result of sudden swells in population density. When we see these 'bursts' or sigmoid curves straight up we should suspect that some event has caused populations to crowd, flourish and affect one another through closer quarters, better technology, or a peaceful interlude. We should suspect as much beginning 35,000 years ago by virtue of the 'art' proliferation and stable paint media. The taphonomy of media had indeed changed allowing us a window into their brains. Carvings, plastic modeling, paint mixtures finally stabilized thinking allowing not just for contemporary transmission of ideas but grandfathered transmission, over weeks, years, decades, centuries and more. And thus, ideas became contagious.

Another such period occurred when the once fertile Sahara became desiccated from the Earth's wobbly rotation sending hordes of tribes to the congested Egyptian Delta in the Early to Mid Neoltihic around 6,000-4,500 BC (Pre-Naqadan, Naqaddan and Amratian, (Figure 8). This conflation of technique and industry could certainly explain how the plodding pre-dynastic output could morph so fast into the brilliance of the late Pre-dynastic and early Old Kingdom (Figure 9). The trajectory is acute for a period of 500-1000 years, only. The contagion of ideas from a new population mix devolved into something never seen before in our human record and in this case, we actually can track the evidence and it is nothing short of genius.

We see lesser versions of the same heady creativity time and again and most fondly during late 19th century France, right after the Franco-Prussian War (1871). The dissemination of lithography (After 1870 the presses were steam driven and shortly thereafter, important dealers like Ambrose Vollard commissioned folios of such prints by his contemporary artist stable) and the birth of museology (British Museum in 1753, Louvre in 1793,Mertropolitan Museum in 1870), led to a heightened awareness of what others were doing. Artists writing from the period have clearly become media freaks, shuffling newspaper clippings, lithos, books, visiting museums, forming clubs, brotherhoods and 'movements' and foisting ideas on one another by the sheer force of their personality. Through it all, the act of coveting creations made by others is key.

Trying to stratify a range of symbolic value from a bird coveting its eggs in a nest, or your child collecting mini cars, or your art dealer building an inventory of found ie other's work is truly injecting preferences rather than objectivity. Consider how far we have come from the manuport collections of pebbles and Neanderthal treasury of burins, points and scrapers to the outré gallery featuring the 'Meltdown Chair' of Tom Price. (Figure 10.) Honestly, how far? This is something most realtors would chuck from the attic before showing a house as they would a floor of bottle caps, or the esoteric post mortem presentation by Pace Wildenstein New York of wood planks, bottles and rags courtesy of Joseph Beuys (Pace Wildenstein 2010).

The geneology of metaphor is quirky, but if you try and separate the almost identical content of these two chronological extremes – one in the Mesolithic the other totally current - then you will get mighty lost in the weeds. The point being that metaphor begins for both in the same place, with selectivity and respect and the rest is contrived justification for a simple, basic visualization tool: Difference.

Thinking out Difference

So let's return to the footprints before moving on to the next item in the practitioner's toolbox. The third set of prints represents two sets of collections. The first is the set laid down by someone else that is coveted and scavenged for a variety of possible reasons. Either they were made immediately and over the prints laid into the hot volcanic ash of an erupting volcano thereby cooling down their contact and assuaging the heat on their soles. Or they were made contemporaneously during a driving rain and again, for the same kind of reasons, for better traction. The third possibility is that they were made much later. Either way, they first had to correctly identify and match what these shapes were in advance.

This meant they had to discriminate for size by an increasing factor as they made their approach since the prints looked much smaller farther away. They had to have carried a sustained symbol of 'foot shape' in their long term memory and matched it up with their own and by so doing moved from semantic subjectivity and what they took for granted about their body to that of a free standing entity and symbol for themselves expressed by the shape of their own foot. With a stable icon representing themselves they could then manipulate and position 'it' within the extended 'self' of some one else.

To anticipate their actions over a specific and relatively long time scale (more than a few minutes see: Fleischer 2007) they had to synchronize their kinesthetic feedback with their upper motor neurons by working off a number of cognitive mapping systems in the hippocampus, the cerebellum and the basal ganglia and thalamus. The cerebellum is a significant planning system for timing these gross motor movements with stimuli in 'forward kinematic models' meaning without regard for external interference.

> "The primary function of the cerebellum is evidently to detect the difference or motor error between an intended movement and the actual movement and through its influence over upper motor neurons to reduce the error" (Purves et al:475)

The predominating nature of its messaging is inhibitory, meaning it depresses synapse activity that might otherwise be distracting. If it didn't my head would nod, eyes would jump incessantly and my arms would flail. Occupying only ten percent of the cortical volume, this ancient cluster of densely packed cells in the rear of the brain, accounts for over fifty percent of the weight. Giant neurons known as Purkinje cells are unique to the cerebellum and secrete one of two primary types of neurotransmitters in the brain.

There are over 100 neurotransmitters. These are the molecules that chemically activate neurons which in turn switch on the secretion of receptors in another cell across the synaptic cleft, a real space in between the cells. The brain also has electrical synapses whose behavior is so swift as to be considered immediate and whose spaces in between cells is logically much smaller and called a 'gap junction'. It follows that these cells are linked with autonomic functions that regulate the body functions such as breathing and hormone secretion and are part of the cloaked cognitive repertoire, the ones we rely upon and are unaware of.

By far the preponderating chemical transmitters come in two flavors, those that excite connections and those that suppress it. Of those 'glutamate' which excites (innervates) connections is released in over half of the brain's synapses. GABA which inhibits (enervates) is present in over thirty percent of synapses both of which (including others) can wage a battle royal in the respective synapses of a single neuron in a process called 'summation' where the collective stimulus for an excitatory response might overpower an inhibitory one. But the cerebellum hosts GABAergic Purkinje's and are inhibitors of transmission. They suppress stimulation and allow us

to manage and direct ourselves. Chemical or structural damage to these cells results in seizures, the sustained lack of muscular control.

> "The cerebellum is involved in learning the timing of motor actions that are not repetitive but must be executed in precise temporal relation to an external stimulus…Another form of prediction ..is the computation of where a limb will be in the near future known as the forward model." (Fleischer 2007:4-5)

Furthermore the cerebellum may coordinate eye and hand movements by means of this forward modeling.

> Maximum eye-hand coordination is achieved by having the eyes slightly lead the hand and the motor system is therefore hypothesized to use forward model information from the ocular motor system to increase accuracy in producing hand movements. (Fleischer 2007:5)

That this is precisely what is taught to children and practiced by anyone in any walk of life but most notably with regard to fabricating forms is obvious.

Down the central strip of the cerebellum along what is called the spinocerebellum is a fractured topographical map of our body. It is one of many such topographies that propagate throughout cortical processing centers for a variety of input. But it cannot exist without the hippocampus and its ability to excite the mapping neurons known as place cells. Much work has been done studying these for rodents in mazes where the firing of long term potentials (successful neuron linkage) has a specific firing rate known as the place field with regard to approach, centrality and departing that field. The hippocampus is well known in part for creating long term memories for route navigation, for the concept of sequence most notably footsteps and tracking that can encode forward sequential behavior.

To step into another step required correctly gating and measuring pace. Try it yourself. No person walks the same way, has the same step, foot size and rhythm. If you could ask your canine how they can hear this in the distance and then go run upstairs and grab its master's sneaker then it is pretty certain by this anecdotal measure that we all have a gait print. For the Laetoli Hominid, this would require at least a semantic understanding of the reach and size of its limbs measured

against a great many externals. To achieve this one needed to be able to plan by means of an acute awareness of autobiographical time and context if they also wanted to match up the left print with the left and the right with right, assuming this happened here. But let's for argument sake say it did since Michael Day's graphs of these footprints seem rather consistent for this (Figure 8, Day 1985:120) – then it seems logical that this be a cognitive stepping stone towards art creation. After all not only is there pattern recognition but also activation, matching and mimicry. In effect, the Laetoli Hominid was drawing a repeat pattern with his body by choreographing his movement. Therefore, one could say that he was well within the cognitive mode of highly subjective designing. He was using his body as a ductile drafting tool by literally connecting the dots of another's footprint.

They were not just thinking about an image they were acting it out kinesthetically. Hey had to control their body movements in conformity with a mental plan and continually shuttle back and forth between sensory input, mental image and physical control. Most notably was the notion of metaphor. In the world of the extended self, which we still inhabit to a degree, they had to make the judgment that another person or specie's print was not toxic. Taking Harvey Cox's tack, they 'decided' these images were actually beneficial and protective.

We make similar assessments today when we purchase clothing. Some buy second hand but most of us don't, steering clear of the 'unknown contagion' of the previous owner and the belief that it could transfer. Others decide it is at least neutral. In effect, what has been scavenged is something that is found, collected and isolated. Whether it be a palimpsest of footsteps millions of years ago or slipping into someone else's jacket, it is an act of celebration, lionized by virtue of mimicry and copying.

Discriminating for difference is therefore basic in the practitioner's arsenal. Physically acting this out by means of making those separations either by mimicry or scavenging leads to another important tool: recognizing the impact of isolating. In my mind this is a transformative bridge from semantic knowing about something to autobiographically taking action on it. What happens at this juncture is the first step in transducing imaging to image creation.

For most anthropologists and neuroscientists, moving up from difference recognition to difference notation represents a cognitive sea change, a Deus Ex Machina event of either genetic manufacture (Mithen 1995,1996) geologic happenstance (Rossano 2009, Petraglia 2007) and/or resulting social adaptions like migrations and colonization (Randall White). Some like Alexander Marshack (1972) were reluctant to give the devil its due regarding Mousterian mobiliary markings and even for early Cro-Magnon 'notations' of around 32,000 years ago though most artists would have come right out and named it 'decorative' from the get go.

A case in point is the Blanchard Plaque (Figure 11), an ovaloid flat faced antler part from the Dordogne, France, with notches along the edges and approximately 70 holes gauged on one face by different implements in 24 different techniques at supposedly different times. What's interesting is his take on this with regard to an epoch believed to have been pre-representational since the remarkable paintings of Grotte Chauvet (Chauvet-Pont-d'Arc Cave) had yet to be found. When they were in fact found in 1994 they proved that a tradition of sophisticated representational imaging was firmly entrenched at almost exactly the same time.

> "It is obvious that the engraved image is neither random nor accidental. Though recognizably serpentine, it is neither art nor decoration….Despite these analytic uncertainties, it is clear that the sets are not accidental, random, decorative or images of 'art'" (Marshack 1972:447)

Frankly the one thing that could not be verified were numerical or lunar theories surrounding this plaque (Though close examination of full holes evolving as crescents does suggest a reasonable possibility). But the one thing that could have been determined based on form and execution, was that this patterned notation employed an essential tool for image creation: 'Differentiating' and 'collecting' dots together; 'isolating' them in a plan or formal image in this case a clearly defined serpentine line; 'executing' that plan by means of 'capture' in a variety of individual and accretive steps. All art is built up of such marks, not one single one ever being some kind of fractal or prefigurement of the finished whole. These were marks made like all hand made objects which we invent as we go. One successful mark both alters the plan for the next marks by triggering an 'answer' mark and on and on. And the mental image shifts accordingly with what is possible versus what had been merely conceived. It is emblematic of the dialogue already

mentioned between a subjective understanding of the 'self' shuttling between gross motor action and re-inventing inward imagery to guide it.

Finally, whoever made it had figured out the most essential characteristic of all art, the need to pin it down in order to focus attention and set up an intimate relationship with it. They confined it as an object. Decoration is no lowly step brother to representation. As far as I'm concerned, one of the greatest testaments of human cognition is still the layered up interwoven patterns of Arabic plasterwork (Figure 12), Belgian lace, 17th and 18th century Italian and German napkin folding per the illustrated manual of Mattia Giegher's 'Li Tre Trattati' published in 1639 and the intricate loom preparations for 17th -19th century patterned textiles.

As for Marshack's suggestion that these differentiated notches must be numberings rather than composed ideations based on the 'time factored' theory of intermittent carving (Marshack 1972:448), all anyone needed to do was understand that 'art' is a process, time factored indeed. The marks I make are never consistent and uniform, they vary in shape, direction, implement, colored in overlays or by section and these are often worked over an extended period of time, as one mark or section helps me sort out the riddle I want this image to answer, over minutes, days, years even. Often I lose the focus of the riddle, the accumulation of hints I have initially concocted and I need to revisit the image after a respite and see if the 'riddle' is still valid. If it isn't, I change the assets of the image by turning the volume up for one attribute over another. Like the aggregate of serpentine dots, every work of art is an accretion or responses to responses. These kinds of cognitive 'insults' must be eschewed because they were not made by a practitioner and therein lies Marshack's gross miscalculation as later borne out by the sophisticated context of the Chauvet finds. In other words, the maker of the Blanchard Plaque was not stumbling but acting out imagery as were his contemporaries.

Confabulating Difference

In 1965 K.M. Sayre wrote the following regarding mechanical pattern recognition for simulation mechanisms:

> (There is) an unclarity about the nature of human behavior we are trying to simulate.

> We simply do not understand what recognition is. And if we do not understand the behavior we are trying to simulate, we cannot reasonably hold high hopes of being successful…(Puccetti 1974: 137)

As mentioned in the opening paragraph of this article, 'art' is an activity, not a thought process. A cartoon character with a thought bubble for a mouse trap hasn't created one, he has only visualized it. In this section we explore how subjectivity confabulates visualization. Whatever that thought bubble is or could be has nothing to do with universal standards - it is his standard. 'Art' begins as an invented and subjective means to 'fill out' or extend perception abilities by caricaturizing difference and sameness. Emphasis on invention. It devolves from the belief that knowing is enough to see and never looks back from there. For fodder it uses the awareness of a free standing self and the narratives that accompany it. But subjectivity, sensing the limits of personal volume and sensations with an autobiographic memory can never be wholly and sharply defined. We struggle with it historically and daily. If it could be easily bounded and delimited, then I for one would not shy away from second hand clothes, from superstition, or for any of those residual doubts. I would know for sure how intact my personal volume is and just how inviolable as well and I would have less doubts about how vulnerable both my psyche, mind,memory and body were.

So this is the human dialogue, the self versus the un-self that fertilizes our persistent search for the best way to read what is around us, where we begin and where we end and whether we are vulnerable and even porous. We'd prefer both as it suits our needs. Sometimes believing we are part of the whole and a piece of the main gives more comfort than standing alone. Philosophers have fought a war of words over this dichotomy but we have yet to make peace with it.

But we must attribute this fertile soliloquy to the limitations of our physical and sensory abilities. We are neither arrogant nor fools and have observed much throughout our existence. This stubborn belief in the extended self derives from an inability to fully split off from the topocosm (Gaster 1950) or the notion that the world is a living entity that merges all the contained boundaries into a greater whole. Given the confusion about separations between self and whole world, our Paleolithic ancestors stumbled across the means to at least know about it as best as they could.

Recognition like symbolism is a nebulous term of degree rather than essence. But it too belongs to the realm of visualization and not vision. This implies that thinking mediates recognition not quanta processing machinery lodged in the retina and optic nerve. Pervasive insecurity with regard to the superior perception of others is no doubt a semantic understanding of most animals including ourselves. We can't see the worm that a frog sees in low light and low temperature because our higher body heat over activates the rhodopsin molecules in our retina without the direct stimulation of a photon (Aho, Krogh 1988, 2008). In other words it creates data that really had no direct stimulus. This acts like static or 'noise;' distracting us from processing any legitimate stimulation. We can't make out the worm that the frog can. It can see it in one eighth the amount of light because the lower body temperature cuts down on 'noise'.

Then again falcons see a ten centimeter object more than half a mile away. Penguins have flat corneas allowing them to see in water and well into the ultra violet range. Pigeons and chameleons have separately rotating eyes. A cockroach can detect movement 6,000 times the size of a hydrogen atom and an ant can detect movement that is five centimeters below the surface. And finally, the octopus has 25 million rods per square millimeter compared to our 90,000. That is quite an amazing difference but there is good reason for it.

Rods and cones are the photoreceptors in the retina that input different data about light quanta through our optic nerve. Not surprisingly, if octopi have so many more rods than we do it would suggest that these receptors are sensitive to low light or value, rather than hue or color. Motion detection does not require color distinctions, only value distinction. A gray flash against a darker ground is all that's needed. However, cones react to the color spectrum of light and in the human eye require 100 photons each compared to the one per rod. When we foveate or fully fix on the 1.2 millimeter fovea center or our eye, there are no rods, only cones. But our peripheral vision is rod populated to the tune of 4.5 million and cone free. This also makes sense, enabling us to sense possibly malevolent motion around us in time to attend to it and quickly adjust. This is our second line of visual defense that selects for movement in case our attention needs to be immediately redirected - but not nearly good enough to ascertain movement thousands of feet below the surface of the ocean. Then again, who would want to?

The fact that we have far more color receptors numbering approximately 90 million tells us we are creatures of white day light as opposed to our domestic cat whose nocturnal behavior we can predict has much to do with their photoreceptive attributes. We suspect that they have more cones that are receptive to red or night light when in fact they have cones that confuse red with green light (deuteranopia). What allows them the ability to hunt in day and night is their rod rich eyes that pool low light levels and have an added structure called a tapetum lucidum reflecting light back one more time to the receptors for additional sensitivity. In fact, just as we have areas that are purely cone rich they have areas that are purely rod rich. That 'eye shine' off the cat's eye is the reflected light off the tapetum and rightly becomes the symbol we use to define their mysterious superiority over us at night.

But even perception among equals is not equal either. We all know that. Normal vision varies widely. It's been postulated that over a billion people are farsighted and that over 2 billion have some kind of refractive issues. I need glasses. Without them my drawing would look a lot different. But if I couldn't see color I could still draw. Therefore, for some, rods are the first order of response for people who have never seen before.

In a study for patient MM who received a corneal transplant after becoming blind at age 3:

> "Motion is particularly efficacious in MM's visual world. He is almost twice as sensitive to moving gratings as to stationary gratings….He does not perceive subjective contours in static displays but does if the display elements are set in motion…These results suggest that motion mechanisms may be more robust to deprivation or perhaps are sustained in the blind by tactile experience." (MacLeod, Fine 2001:1)

On the other hand, even if we can't see the white worm in darkness, some of us can catch subliminal images in the flicker rate of film frames which pass by at 24 per second and thirty for video - at least for those who have been trained to visualize by means of editing one frame at a time. So while we come to understand that cognition smoothes out 'flat' images strung together in a long sequence some of us still can catch interruptions or 'difference' even at these fast rates. It is not that we see each frame, but we are trained to perceive pattern interruptions at greater speeds. In effect, we are slowing down our cognitive 'smudging' effect. These are the judgments we make about visualization and recognition. Graphic artists slow down 'seeing' even more

because they aren't thinking about an aggregate impression of motion. They are fixated on the exposition of a static frame namely their canvas, their drawing, their print. I don't know of any experiment that tests for these professional differences in subliminal perception, but I would guess that those who are trained to invest it all in one pictorial format might not be as receptive to 'seeing' individual frames because they do not think in these terms. But you can learn this skill.

The advertising world has long known that the majority, rather than being able to consciously name it, have none the less absorbed the image in their working memory and can act on it. We actually are rather sensitive to flicker rates or how fast images pulse and change. In fact, the very computer screen you are now viewing has a much faster flicker rate because of our particular sensitivity to its brightness. But it is nonetheless pulsing. If it were markedly slower than the standard 60 to 75 hz or pulses per second, we would sense an annoying oscillation. Which is why television emissions smooth out their ratio by building in double frames so that the flicker rate is increased to around 50-60 hz. We are insensitive to oscillation beyond 100hz. This is called flicker fusion. The take away? Nothing we view is ever constant. We make it so in our minds by preferring to draw conclusions.

Edwin Land discovered the notion of color constancy (Hubel 1986), that color perception persists for us despite the vagaries of a light source. For example, you think the apple is red at dusk even though direct color comparisons would indicate it is no longer so. We do not see 'true' color we see contextual color. Artists are well aware of this, anyone in fact who regularly works with color. If you want to paint your house tan, selecting a red trim will predispose you to viewing a reddish tan. My father taught me this when I was young. He asked me what color the shadow of a tree was. My verbal lexicon trumped my visual one and I answered that it was dark and therefore gray. But he held up a red scarf and I could see it was completely blue.

Eventually, human cognition converted that passive suspicion about our limited and partial perception into an active tool that caricaturized difference and sameness by those who were best suited to make the conversions so that others, the 'appreciators' might use it to ameliorate their ability to recognize.

> In the beginning, man went forth each day--some to do battle, some to the chase; others, again, to dig and to delve in the field--all that they might gain and live, or lose and die. Until there was found among them one, differing from the rest, whose pursuits attracted

him not, and so he stayed by the tents with the women, and traced strange devices with a burnt stick upon a gourd. (Whistler 1892)

All of us have had the experience of viewing some painting, let's say, of a tree that so successfully pins down the caricature that we can store it like a filter and screen for examples in nature to fit the paradigm rather than the reverse. This is why we can say that's a Van Gogh Tree, or a Whistler night or a Degas Dancer. It harks back to the invention of art to heighten perception so that recognition can be processed with far greater speed. Put another way, 'Image Making' is deciphering that is basic to all animal survival where certain patterns are triaged above others as worthwhile so that useless ones can be overlooked and discarded to avoid unnecessary mental distractions. I have suggested throughout that 'art' is simply the human form of this same behavior; the adaptive response of our finer motor and cognitive skills constructed over time. (Renfrew: 2008 '*This must lay emphasis upon the plasticity of the human brain (its capacity to adapt within a single lifespan to new conditions) and on the aspects of the socialization process of shared experience.*'))

Seeing Is Believing

If visualization is ultimately, 'knowing enough to see' than at what point does knowledge fail us? Obviously, there has to be some sensory input to confabulate seeing but just how little is needed and exactly what sensory pathways must be involved? How little is enough and how much of that is knowing? For instance, where do we draw the line where emotional, physical or cognitive extremes pervert the concept entirely? If I see a dot and believe it's a flying saucer and you see a dot and believe it's eye floaters or fire ants whose 'visualization' is valid? Are baselines restricted to physical limitations such that we can't see a worm in low light? And if so, then how can so many with deprivations manage to 'construct' visualizations by other means? Upon what grounds are they validated or invalidated?

And if the mind connects the dots so to speak by acting as the confabulator of imagery, then how does the brain wire itself to such an idiosyncratic habit? How do two people with the same exact eye prescription extract different things from the same scene? In 1966 De Groot showed that within 5 seconds a master chess player gets more relevant information than a lesser player in 15 minutes. In fact they can replicate the board with ease. However, place the pieces at random and

the master players, “are no better than weak players in reproducing the position after a five second exposure. (Pucceti 1974:150)

The over simplified answer is that they know the structure of the story better because the story means more to them. And for one reason or another either fired up by personal pride and adrenaline, their memories for these stories are therefore more significantly weighted than for others. Or as Carla Schatz far more simply put it, “Neurons that fire together are wired to together.” (Doige 2007:63)

In the past fifty years we have learned that the brain has preferred stationary hubs for processing our activities. In the past fifty years we have learned that it is plastic and that those hubs are neither rigidly mapped nor fixed by age or time. They can vary from day to day, year to year and more importantly are autobiographically innervated given the vagaries of life experience including corporeal changes, deprivations and deficiencies.

In 1949 Donald O. Hebb suggested what anecdotal evidence has proven since time immemorial, that learning changes the linkage of neurons in new ways. Taken further, Charles Sherrington and Charles Darwin maintained that for those species for whom the risk became the reward, the new linkage seared itself by becoming in some respects adaptive and then innate but not absolute or permanently fixed. If survival depends on perspicacity and rapid response, then ‘creating’ physical solutions to environmental riddles in the form of manufactured imagery also applies. How we draw upon our personalized basket of sensations is the platform that we now need to consider.

Michael Bach y Rita while working in the 1960’s in Germany studied how vision works on the cat’s brain at around the same time that the Nobel prize winning team of David Hubel and Torsten Weisel did the same. For both the intent was to demonstrate the nature of neuron responsiveness in the visual cortex when viewing a specific image and which nerve clusters spiked in what context. The second team discovered (in addition to their work on the Macaque monkey) what became axiomatic at least for while, that the visual cortex is an essentially cubic piece of woven cloth (some call it the ice cube) comprising six general layers of cell types. Neurons appeared to line up in alternating vertical columns that processed one visual element each. ‘Slabs’ saw line motifs in each eye– such as degrees of slanting and ‘blobs’ saw specific colors:

> "They begin to explain the physiology behind the psychophysics explored by Edwin Land…(color constancy despite luminescence variation) especially the fact that colors in a scene are so incredibly constant" despite the light source. (Hubel 1986:101)

Out of this grew a belief in a highly 'constructed' and localized brain and with good reason. They discovered that a window of opportunity for motoring up what I call 'flavors' existed for a limited period so that a cat if by four months had been deprived of sight in one eye would always behave as if blind in that eye whereas a normal adult if deprived for the same length of time would not. If they didn't use it by a certain period they'd lose it. "Abnormal experience in an early developmental could permanently disrupt initially formed circuits." (Constantine- Paton 2008:3)

Bach y Rita, saw something else. When they wired up the cat's brain to note how it 'spiked' on viewing a specific image, they noticed that accidentally touching the paw also caused electrical activity in the same area. For understanding visualization and therefore, 'art' this finding is perhaps even more important because every practitioner already knows this. It has been taught in the classroom for epochs. We instruct our students before undertaking any rendering, to 'feel' the volume. This is not poetic whimsy, it is how we construct images based upon a mirroring or projecting of the self in place of the object. It is subjective to experience.

I am certain that if you monitored the impulses of my leg or back as I tried to render a straight line, you would see the same thing that Bach y Rita saw in the cat. We visualize by kinesthetically mimicking or acting out the direction of the line or the movement. We draw buildings with an innate understanding of weight and pressure and in some degree 'feel it'. Only in part are we are feeling 'boundaries' best explained by Rudolph Arnheim research on art for the blind. (Arnheim 1990:63)

> "When it became evident that blind persons take to the use of lines without hesitation once they can control them by touch, there was considerable surprise. How can one understand the meaning of lines without the help of vision? But of course lines are not copies of line like shapes observed in nature. They are the spontaneous graphic equivalent of the boundaries or elongated shapes of physical objects."

My back straightens like a board when I am trying to perfect a straight line. It is no easy task to do so free hand and fluidly. When I draw a body, the spindles or 'mechano receptors' in my joint muscles 'mimic' theirs according to my innate sympathetic understanding. How this feels spikes my ability to 'see' it. This pervasive coordination of 'capture' has been found for sound as well, though I doubt to the same degree. Therefore, the visual cortex is not 'sight' specific. It interprets and translates across sensory modules.

This suggests far more diversity than the generalized gross structure of the visual cortex that has long been divided into a lower ventral stream that is sensitive to the 'what-ness' of an object and the upper dorsal stream which is sensitive to object location and the 'where and how' of it. Motion is detected here. Our optic behavior receives cues from this system by helping adjust our ability to track objects and how much to adjust for it. We accomplish this by means of saccades, the 'jumps' our eyes make to shift focus from one thing to another. Our seeming ease in making these endless adjustments might suggest it is automatic, that volition could not be in constant play. But this does appear to be the case.

The thalamus, a deep brain nucleus of cells right above the spinal column is also part of the ancient brain. It appears to have been the original 'decider' before our neo cortex enveloped it. But it retains enough of those deterministic functions to act like a swinging door. Other than the olfactory system which by passes it completely, sensory input after it is captured must pass through here for interpretation to particular hubs and then back again to the neo cortex. Decisions appear to be somewhat formed as they are gated back to our relatively modern cortex.

Take those little 'saccades' that we all use to refocus our vision. They are very much in tune with our behavioral goals, ie our intentions. "…Central thalamic neurons play a role in the context dependent linkage of sensory signals and saccadic commands…for which the central thalamus serves as the penultimate synapse." (Wyder et al 2004:2628) The thalamus may very well be the switching station for determining relevance and therefore 'knows' that I will shift my focus and how far before I actually do it. It is not reflexive, it is thoughtful. But you didn't have to be told that. You know that you look where you want to. But it also helps regulate how far to adjust your focus so you don't overshoot your goal. I owe a great deal therefore, to the thalamus. With out it, I could never find my place back on the right cross bar of the train trestle after I have momentarily turned away from it to draw it on the pad. I also owe a great deal to my short term memory.

In my most relaxing moments I believe I rest my eyes on overall patterns that repeat. The reason for this is I simply don't want to think. I believe this makes me comfortable and unworried. I know that when I sit on my deck and look out to the high grass beyond, I can scan across the field content to know that it is behaving as it should. Except, I am doing quite the opposite. Whatever micro modules in my brain that process data might be, and no doubt this is ardently researched, the fact remains that on an anecdotal level – I am shutting down all the possible feedback on the minute and overall details of this field because it is just too much information; what blade looks like another, which is this or that color. While my intention is to generalize the 'behavior' of this field the cognitive reason is that I am discarding 'noise', the unnecessary details. I do so instinctively, no matter how far out I look or how close in, whether I concentrate on one blade of grass or a tuft in the field. I turn the 'Noise' off so I can turn the volume up for what is different, a goal I seek no matter how hard I try not to. We call this 'contrast enhancement'. Artists gorge on this instinct which is attributed to a cognitive wiring, present, I would think, in all creatures large and small.

> Within the module the influence if excitatory and inhibitory synapses is structured so that differences, rather than absolutes can be nest detected. This arrangement might address a common cortical problem: How to distinguish the signal from the noise, or the item of interest form the background. (Miller 1987:705)

Humans require repetition or sameness as a background for survival discrimination. This is the yang-iness to the ying I previously mentioned. It allows the brain to fire efficiently by selecting for difference. When the background or miasma of sameness is removed, the 'noise' if you will is turned up too high. For instance, we have all heard of the Chinese Water Torture. What we don't realize is that the concept is based on the randomness of drops rather than the regularity such that the victim who is tied down and unable to consider anything else, cannot turn off the 'noise' because all of it is about difference, there is no backdrop of routine. The brain, no doubt, is over stimulated and over synapsing leads to insanity, as the legend go.

So we return to where we began this discussion. Recognizing difference against a backdrop of uniformity is the norm. Acting it out is also the norm, finding the worm, seeing the grass move oddly, noticing a different tone of voice in your child though the words are the same or a different manner. These are the criteria for warnings, both pleasurable and malevolent. Scavenging and collecting are also typical for most creatures, the interpretation of which these 'objects' prompt other responses. To say these basic cause and effect behaviors are not symbolic is, I believe, inordinately constrained by willfully imposing preferred criteria.

If the artist practitioner depends on the exploitation of difference for greater effect, then this ultimately physical activity begins by separating found objects into like piles that become relatively fixed. As seen in the Acheulian manuports collections that are hardly much different than a Bower Bird's scavenging for red objects, appreciating such found objects can hardly be said to have changed that much in our personal domestic behavior. Our homes are collections of things we have scavenged. We have physically brought them together in a pile. The same holds true on a more 'intellectual- esoteric' level with regard to avant garde art. The Art Gallery Director despite their erudition and manner is doing nothing more than assembling found objects, in this case made by others, and in the artist's case often merely a different packaging of found objects. Such is 'Conceptual Art'.

But when the Africanus hominid placed his foot into the footprint of another he was doing more than collecting. He was recreating an image by assimilating it with his own physical dimension and fitting his body to it. He was capturing the image through a number of different senses by fusing valuations together. Give him the credit he deserves.

March - 2010

Footnotes:

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Reproduction List

1. 'Pat the Bunny' cover.
2. 'Venus of Willendorf", Austrian 22,000 BCE in Naturhistorisches Museum, Vienna, Austria
3. "Egg and Thorn' – print ad from the Tatti Collection for Arpa USA, High Pressure Laminate
4. "Ceilings" print ad for US Gypsum Company 2007
5. Grotte de Gargas, Haute Garonne, France, Gravettien Period, Upper Paleolithic ca 27,000 BC
6. Albert Allens' 'Fourth Dimension' originally featured at the Sherry Hill Fine Arts, Colorado Springs, Colorado, May 2010 image reproduced in article by Lourdes Reigosa, March 9th for *Haute Magazine*
7. MH Day 1985:120, Laetoli Footprints, "Overprinted left track G2/3 number 26'
8. Male Figurine, Ivory 6.5 cm (2 ½ inches) Egypt, Late Naqada 1 – Early Naqada 2 (Mahasna and Amratian also known as Early Pre-Dynastic) - around 3,750 -3,550 BC (Metropolitan/Museum Rogers Fund)
9. "Palette of Narmer" or 'The Great Palette of Hierakonpolis', 63 cm (24.8 inches) Late Pre-Dynastic Period, Ancient Egypt around 3,200 BC ceremonial on green siltstone, collection of Egyptian Museum in Cairo
10. Tom Price's 'Meltdown Chair' from his series as seen in London's Festival of Arts 2010

10a Joseph Beuys, 'Bottles' courtesy of Pace/Wildenstein Feb. 2010, New York (not included)

11. The (Abri) Blanchard Plaque, Aurignacian from Sergeac, France now in the Musée des Antiquités Nationales at St-Germain-en-Laye, (source unknown, courtesy of Donsmaps.com)
12. Mudéjar - Arabic Plaster work from the Alhambra, Granada, Spain around 1350 AD Hall of the Abencerrajes, the Stalactite Ceiling
13. French loom designs and threadings from 1848 apprentice's course book (privately owned – not included)

Images: Page one

Images for 'Practitioner's Toolbox' - page one

Figure 1. 'Pat the Bunny' cover,
Kunhardt 1940

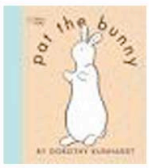

Figure 2. Venus of Willendorf
11 cm high (4.3 inches)
Austrian ca 22,000 BCE

Figure 3. 'Egg and Thorn'
print ad for Tatti laminate collection
of Arpa USA.

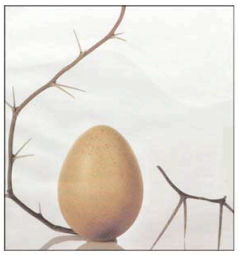

Figure 4. "Ceilings' print ad
for US Gypsum

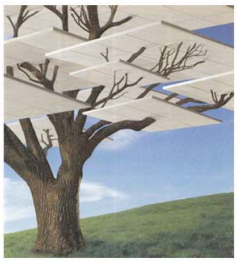

Figure 5. Hand Stencils in the
Grotte de Gargas, Haute Garonne
France - Gravettien about 27000 BCE
,

Figure 6. Albert Allen's 'Fourth Dimension'
Sherry Hill Galleries, 2010

Figure 7. 'Over printed Left track G2/3, number 26"
Laetoli footprints,contour drawing by MH Day 1985

Images for 'Practitioner's Toolbox' page two

Figure 8. Male Figurine, Ivory, 6.5 (2 1/2 inches)
Naqada 1-2, Egypt around 3,600 BC

Figure 9. 'Palette of Narmer', 63 cm (24 inches)
Green siltstone, Pre-dynastic, Egypt around 3.100 BC

Figure 10. Tom Price's 'Meltdown Chair'
fabric and polymer 2010

Figure 11. 'The Blanchard Plaque"
Sergeac, Dordogne, France Upper Paleolithic

Figure 12. Mudéjar Plaster work, Mid 14th c
The Stalactite Ceiling in the Hall of the Albencerrajes, Alhambra, Granada - Spain